

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

shock absorbing means located at a contact position where said reinforce roller and said guide plate contact each other.

Claim 2 (Original): The finisher as claimed in claim 1, wherein said shock absorbing means comprises an elastic projection protruding from part of a circumferential surface of said reinforce roller that does not contact the stack.

Claim 3 (Original): The finisher as claimed in claim 2, wherein said projection comprises a flange-like member protruding from a side of said reinforce roller over the circumferential surface of said reinforce roller.

Claim 4 (Original): The finisher as claimed in claim 1, wherein said shock absorbing means comprises an elastic strip provided on a surface of said guide plate along the fold of the stack.

Claim 5 (Original): The finisher as claimed in claim 1, further comprising control means for causing said reinforce roller to reinforce the fold of the stack during each of a forward and a backward movement via said drive means.

Claim 6 (Original): The finisher as claimed in claim 1, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 7 (Original): The finisher as claimed in claim 6, further comprising:
a support member supporting said reinforce roller; and
a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 8 (Original): The finisher as claimed in claim 6, wherein said guide member is formed with a corner for restricting the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 9 (Original): The finisher as claimed in claim 6, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 10 (Original): The finisher as claimed in claim 6, wherein said guide member comprises two parallel guide members.

Claim 11 (Original): The finisher as claimed in claim 10, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 12 (Original): The finisher as claimed in claim 11, further comprising biasing means for constantly biasing said support member toward said guide plate.

Claim 13 (Original): The finisher as claimed in claim 1, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 14 (Original): The finisher as claimed in claim 1, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 15 (Original): The finisher as claimed in claim 14, wherein said guide plate comprises:

supporting means for supporting said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

biasing means for exerting a pressing force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 16 (Original): The finisher as claimed in claim 14, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 17 (Original): The finisher as claimed in claim 1, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 18 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

control means for causing said reinforce roller to move at a lower speed when coming down from the stack onto said guide plate after pressing said stack than when pressing said stack, whereby an impact ascribable to contact of said reinforce roller with said guide plate is reduced.

Claim 19 (Original): The finisher as claimed in claim 18, wherein said control means lowers a moving speed of said reinforce roller not only during a forward movement but also during a backward movement.

Claim 20 (Original): The finisher as claimed in claim 18, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 21 (Original): The finisher as claimed in claim 20, further comprising:
a support member supporting said reinforce roller; and
a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 22 (Original): The finisher as claimed in claim 20, wherein said guide member is formed with a corner for restricting the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 23 (Original): The finisher as claimed in claim 20, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 24 (Original): The finisher as claimed in claim 20, wherein said guide member comprises two parallel guide members.

Claim 25 (Original): The finisher as claimed in claim 24, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 26 (Original): The finisher as claimed in claim 25, further comprising biasing means for constantly biasing said support member toward said guide plate.

Claim 27 (Original): The finisher as claimed in claim 18, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 28 (Original): The finisher as claimed in claim 18, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 29 (Original): The finisher as claimed in claim 28, wherein said guide plate comprises:

supporting means for supporting said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

biasing means for exerting a pressing force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 30 (Original): The finisher as claimed in claim 28, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 31 (Original): The finisher as claimed in claim 18, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 32 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a support member supporting said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said drive means causes said reinforce roller to move along said guide member.

Claim 33 (Original): The finisher as claimed in claim 32, further comprising a bend-preventing member configured to prevent, when said reinforce roller presses the stack, said guide member from bending due to a pressing force of said reinforce roller.

Claim 34 (Original): The finisher as claimed in claim 33, wherein said bend-preventing member comprises:

a guide positioned at a side opposite to said guide plate with respect to said guide member and extending in parallel to said guide member; and

a contact member mounted on an end of said support member remote from said reinforce roller and contacting said guide;

wherein said reinforce roller is movable with said contact member contacting said guide.

Claim 35 (Original): The finisher as claimed in claim 32, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 36 (Original): The finisher as claimed in claim 35, further comprising:

a support member supporting said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 37 (Original): The finisher as claimed in claim 35, wherein said guide member is formed with a corner for restricting the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 38 (Original): The finisher as claimed in claim 35, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 39 (Original): The finisher as claimed in claim 35, wherein said guide member comprises two parallel guide members.

Claim 40 (Original): The finisher as claimed in claim 39, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 41 (Original): The finisher as claimed in claim 40, further comprising biasing means for constantly biasing said support member toward said guide plate.

Claim 42 (Original): The finisher as claimed in claim 32, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 43 (Original): The finisher as claimed in claim 42, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 44 (Original): The finisher as claimed in claim 43, wherein said guide plate comprises:

supporting means for supporting said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

biasing means for exerting a pressing force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 45 (Original): The finisher as claimed in claim 43, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 46 (Original): The finisher as claimed in claim 32, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 47 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

shock absorbing means located at a contact position where said reinforce roller and said guide plate contact each other.

Claim 48 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

control means for causing said reinforce roller to move at a lower speed when coming down from the stack onto said guide plate after pressing said stack than when pressing said stack, whereby an impact ascribable to contact of said reinforce roller with said guide plate is reduced.

Claim 49 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a support member supporting said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said drive means causes said reinforce roller to move along said guide member.

Claim 50 (Currently Amended): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

monitoring means for monitoring a movement of said reinforce roller; and

control means for causing, when an error is detected during movement of said reinforce roller, said reinforce roller to move to a home position and causing display means to display a jam message.

Claim 51 (Original): The finisher as claimed in claim 50, wherein said monitoring means comprises:

first sensing means for sensing the home position of said reinforce roller; and

second sensing means for sensing an end-of-reinforcement position where said reinforce roller ends pressing the fold.

Claim 52 (Original): The finisher as claimed in claim 50, wherein when said reinforce roller fails to return to the home position within a preselected period of time, said control means determines that said reinforce roller is fully locked and unable to return and

that and error unable to be dealt with by a user has occurred, while causing said display means to display an error message.

Claim 53 (Original): The finisher as claimed in claim 50, wherein when the error has occurred, said control means inhibits said reinforce roller from pressing a following stack of sheets.

Claim 54 (Currently Amended): An image forming system comprising:
an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and
a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;
said sheet finisher comprising:
a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;
a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;
drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;
monitoring means for monitoring a movement of said reinforce roller; and
control means for causing, when an error is detected during movement of said reinforce roller, said reinforce roller to move to a home position and causing display means to display a jam message.

Claim 55 (Original): The system as claimed in claim 54, wherein said display means is included in said image forming apparatus.

Claim 56 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate; and

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

wherein said drive means causes a moving speed of said reinforce roller to vary from a time when said reinforce roller contacts the stack to a time when said reinforce roller does not contact said stack.

Claim 57 (Original): The finisher as claimed in claim 56, wherein said drive means causes said reinforce roller to move at a lower speed when getting on the stack than when rolling on said stack.

Claim 58 (Original): The finisher as claimed in claim 57, wherein said drive means increases the moving speed of said reinforce roller to a preselected speed after said reinforce roller has got on the stack.

Claim 59 (Currently Amended): The finisher as claimed in claim 56, wherein assuming that said reinforce roller moves at a speed V_1 before getting on the stack, at a speed

V2 when getting on said stack, at a speed V3 before coming down from said stack, at a speed V4 when coming down from said stack and at a speed V6 after coming down from said stack, then said drive means satisfies:

$$V1 \geq V2$$

$$V6 \geq V4$$

$$V3 > V2, V4,$$

Claim 60 (Original): The finisher as claimed in claim 56, wherein said drive means causes said reinforce roller to move at a higher speed when the stack is absent than when said stack is present.

Claim 61 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate; and

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

wherein said drive means causes a moving speed of said reinforce roller to vary from a time when said reinforce roller contacts the stack to a time when said reinforce roller does not contact said stack.

Claim 62 (Original): In a sheet finisher for pressing a fold of a sheet stack folded for thereby reinforcing said fold, control means determines whether or not to execute processing for pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 63 (Original): The finisher as claimed in claim 62, wherein when the number of sheets is equal to or larger than a preselected value, said control means executes said processing.

Claim 64 (Original): The finisher as claimed in claim 63, wherein said control means varies a number of times of pressing in accordance with the number of sheets.

Claim 65 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

control means for controlling said drive means;

wherein said control means causes said reinforce roller to perform pressing in accordance with a number of sheets constituting the stack.

Claim 66 (Original): The finisher as claimed in claim 65, wherein said control means varies a moving speed of said reinforce roller during pressing in accordance with the number of sheets.

Claim 67 (Original): The finisher as claimed in claim 65, wherein said control means varies a number of times of pressing in accordance with the number of sheets.

Claim 68 (Original): The finisher as claimed in claim 65, further comprising sensing means positioned upstream of said reinforce roller in the direction of sheet conveyance for sensing the stack, wherein said control means causes said reinforce roller to continuously press the fold until said sensing means senses a following next stack of sheets.

Claim 69 (Original): The finisher as claimed in claim 68, wherein said control means varies a moving speed of said reinforce roller during pressing in accordance with the number of sheets.

Claim 70 (Original): The finisher as claimed in claim 65, wherein said control means varies a number of times of pressing in accordance with the number of sheets.

Claim 71 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to press a fold of a sheet stack for thereby reinforcing said fold and comprising control means for determining whether or not to execute processing for pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 72 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to press a fold of a sheet stack folded for thereby reinforcing said fold and comprising control means for determining whether or not to execute processing for pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 73 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

control means for controlling said drive means;

wherein said control means causes said reinforce roller to move to a position close to an edge of the stack to be pressed beforehand and wait at said position.

Claim 74 (Original): The finisher as claimed in claim 73, wherein said control means determines, when causing said reinforce roller to move to said position beforehand, a distance of movement in accordance with size information received.

Claim 75 (Original): The finisher as claimed in claim 74, wherein the distance of movement is selected to be two times as great as a distance between a stand-by position of said reinforce roller and a widthwise center of the stack to be pressed by said reinforce roller.

Claim 76 (Original): The finisher as claimed in claim 74, wherein the size information is received from an image forming apparatus from which the sheets are sequentially transferred to said finisher.

Claim 77 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets each carrying an image formed thereon;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

drive means for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

control means for controlling said drive means;

wherein said control means causes said reinforce roller to move to a position close to an edge of the stack to be pressed beforehand and wait at said position.

Claim 78 (Original): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

first drive means for causing said reinforce roller to move in a direction perpendicular to a direction of sheet conveyance with an electric driving force; and

second drive means for allowing an operator to move said reinforce roller by hand.

Claim 79 (Original): The finisher as claimed in claim 78, wherein said first drive means comprises a motor, a drive pulley driven by said motor, a driven pulley and a belt passed over said drive pulley and said driven pulley, and

said second drive means comprises a lever connected to said driven pulley for allowing the operator to rotate said driven pulley by hand.

Claim 80 (Original): The finisher as claimed in claim 78, further comprising releasing means for releasing said reinforce roller from the stack at a pressing position.

Claim 81 (Original): The finisher as claimed in claim 80, wherein said releasing means comprises:

a first guide member supporting said reinforce roller such that said reinforce roller is capable of moving in a direction perpendicular to the direction of sheet conveyance;

a first shaft supporting said first guide member such that said first guide member is angularly movable about one end thereof; and

first locking means for selectively locking or unlocking said first guide member at said pressing position.

Claim 82 (Original): The finisher as claimed in claim 81, wherein said first shaft comprises a shaft of said driven pulley.

Claim 83 (Original): The finisher as claimed in claim 81, wherein said first drive means is supported by said first guide member while said first shaft is included in said first guide member.

Claim 84 (Original): The finisher as claimed in claim 80, wherein said releasing means comprises:

a second guide member receiving a pressing force of said reinforce roller;

a second shaft supporting said second guide member such that said second guide member is angularly movable in a direction perpendicular to the direction of sheet conveyance; and

second locking means for selectively locking or unlocking said second guide member at a pressing position assigned to said reinforce roller.

Claim 85 (Original): The finisher as claimed in claim 80, wherein said releasing means comprises:

a second guide member receiving a pressing force of said reinforce roller;

a third shaft supporting said second guide member such that said second guide member is angularly movable in a direction perpendicular to the direction of sheet conveyance; and

third locking means for selectively locking or unlocking said second guide member at a pressing position assigned to said reinforce roller.

Claim 86 (Original): An image forming system comprising:

an image forming apparatus comprising image forming means for forming an image on a sheet in accordance with input image data and sheet feeding means for feeding sheets to said image forming means one by one; and

a sheet finisher configured to fold a stack of sheets each carrying an image formed thereon;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

first drive means for causing said reinforce roller to move in a direction perpendicular to a direction of sheet conveyance with an electric driving force; and

second drive means for allowing an operator to move said reinforce roller by hand.

Claim 87 (New): A sheet finisher configured to fold a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a shock absorber located at a contact position where said reinforce roller and said guide plate contact each other.

Claim 88 (New): The finisher as claimed in claim 87, wherein said shock absorber comprises an elastic projection protruding from part of a circumferential surface of said reinforce roller that does not contact the stack.

Claim 89 (New): The finisher as claimed in claim 88, wherein said projection comprises a flange-like member protruding from a side of said reinforce roller over the circumferential surface of said reinforce roller.

Claim 90 (New): The finisher as claimed in claim 87, wherein said shock absorber comprises an elastic strip provided on a surface of said guide plate along the fold of the stack.

Claim 91 (New): The finisher as claimed in claim 87, further comprising a controller configured to cause said reinforce roller to reinforce the fold of the stack during each of a forward and a backward movement via said driver.

Claim 92 (New): The finisher as claimed in claim 87, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 93 (New): The finisher as claimed in claim 92, further comprising:
a support member supporting said reinforce roller; and
a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 94 (New): The finisher as claimed in claim 92, wherein said guide member is formed with a corner configured to restrict the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 95 (New): The finisher as claimed in claim 92, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 96 (New): The finisher as claimed in claim 92, wherein said guide member comprises two parallel guide members.

Claim 97 (New): The finisher as claimed in claim 96, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 98 (New): The finisher as claimed in claim 97, further comprising a bias device configured to bias said support member toward said guide plate.

Claim 99 (New): The finisher as claimed in claim 87, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 100 (New): The finisher as claimed in claim 87, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 101 (New): The finisher as claimed in claim 100, wherein said guide plate comprises:

a support device configured to support said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

a bias device configured to exert a pressing force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 102 (New): The finisher as claimed in claim 100, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 103 (New): The finisher as claimed in claim 87, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 104 (New): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a controller configured to cause said reinforce roller to move at a lower speed when coming down from the stack onto said guide plate after pressing said stack than when pressing said stack, whereby an impact ascribable to contact of said reinforce roller with said guide plate is reduced.

Claim 105 (New): The finisher as claimed in claim 104, wherein said controller lowers a moving speed of said reinforce roller not only during a forward movement but also during a backward movement.

Claim 106 (New): The finisher as claimed in claim 104, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 107 (New): The finisher as claimed in claim 106, further comprising:
a support member configured to support said reinforce roller; and
a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 108 (New): The finisher as claimed in claim 106, wherein said guide member is formed with a corner configured to restrict the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 109 (New): The finisher as claimed in claim 106, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 110 (New): The finisher as claimed in claim 106, wherein said guide member comprises two parallel guide members.

Claim 111 (New): The finisher as claimed in claim 110, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 112 (New): The finisher as claimed in claim 111, further comprising a bias device configured to constantly bias said support member toward said guide plate.

Claim 113 (New): The finisher as claimed in claim 104, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 114 (New): The finisher as claimed in claim 104, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 115 (New): The finisher as claimed in claim 114, wherein said guide plate comprises:

a support device configured to support said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

a bias device configured to press with a force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 116 (New): The finisher as claimed in claim 114, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 117 (New): The finisher as claimed in claim 104, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 118 (New): A sheet finisher configured to fold a stack of sheets each of which includes an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a support member configured to support said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said drive device causes said reinforce roller to move along said guide member.

Claim 119 (New): The finisher as claimed in claim 118, further comprising a bend-prevention member configured to prevent, when said reinforce roller presses the stack, said guide member from bending due to a pressing force of said reinforce roller.

Claim 120 (New): The finisher as claimed in claim 119, wherein said bend-prevention member comprises:

a guide positioned at a side opposite to said guide plate with respect to said guide member and extending in parallel to said guide member; and

a contact member mounted on an end of said support member remote from said reinforce roller and contacting said guide;

wherein said reinforce roller is movable with said contact member contacting said guide.

Claim 121 (New): The finisher as claimed in claim 118, further comprising a regulating member configured to prevent said reinforce roller from tilting when said reinforce roller moves on the fold of the stack while pressing said fold.

Claim 122 (New): The finisher as claimed in claim 121, further comprising:

a support member supporting said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said regulating member comprises a stationary guide adjoining a locus of movement of said support member and an elongate slot formed in said guide plate in parallel to said guide member and receiving part of said support member, whereby said reinforce roller is movable while being restricted in movement in a circumferential direction of said guide member.

Claim 123 (New): The finisher as claimed in claim 121, wherein said guide member is formed with a corner for restricting the movement of said support member in the circumferential direction of said guide member, so that said regulating member comprises said guide member.

Claim 124 (New): The finisher as claimed in claim 121, wherein said guide member is polygonal in a section perpendicular to an axial direction of said guide member, so that said regulating member comprises said guide member.

Claim 125 (New): The finisher as claimed in claim 121, wherein said guide member comprises two parallel guide members.

Claim 126 (New): The finisher as claimed in claim 125, wherein said two guide members are mounted on said guide plate such that said support member is movable in a direction perpendicular to said guide plate.

Claim 127 (New): The finisher as claimed in claim 126, further comprising a device configured to constantly bias said support member toward said guide plate.

Claim 128 (New): The finisher as claimed in claim 118, further comprising a regulating member configured to prevent a support member, which supports said reinforce roller, from tilting.

Claim 129 (New): The finisher as claimed in claim 128, wherein when said reinforce roller is held in a stand-by position, a nip between said reinforce roller and said guide plate is positioned at a same height as the nip of said fold roller pair.

Claim 130 (New): The finisher as claimed in claim 129, wherein said guide plate comprises:

a support device configured to support said support member such that said support member is movable in an up-and-down direction perpendicular to the direction of sheet conveyance; and

a bias device configured to exert press with a force equal to, but opposite in direction to, a pressing force of said reinforce roller.

Claim 131 (New): The finisher as claimed in claim 129, wherein said guide plate comprises a regulating member configured to prevent said reinforce roller from tilting when moving on and pressing the fold of the stack.

Claim 132 (New): The finisher as claimed in claim 118, wherein part of said reinforce roller contacting the stack comprises a high friction member.

Claim 133 (New): An image forming system comprising:

an image forming apparatus comprising an image forming device configured to form an image on a sheet in accordance with input image data and sheet feeder configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming device;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a shock absorber located at a contact position where said reinforce roller and said guide plate contact each other.

Claim 134 (New): An image forming system comprising:

an image forming apparatus comprising image forming apparatus configured to form an image on a sheet in accordance with input image data and sheet feeder configured to feed sheets to said image forming apparatus one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a controller configured to cause said reinforce roller to move at a lower speed when coming down from the stack onto said guide plate after pressing said stack than when pressing said stack, whereby an impact ascribable to contact of said reinforce roller with said guide plate is reduced.

Claim 135 (New): An image forming system comprising:

an image forming apparatus comprising image forming apparatus configured to form an image on a sheet in accordance with input image data and sheet feeder configured to feed sheets to said image forming apparatus one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a support member configured to support said reinforce roller; and

a stationary guide member configured to guide said support member in a direction perpendicular to the direction of sheet conveyance;

wherein said drive device causes said reinforce roller to move along said guide member.

Claim 136 (New): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a monitoring apparatus configured to monitor a movement of said reinforce roller; and,

a controller configured to cause said reinforce roller to move to a home position and to cause a display means to display a jam message when an error is detected during movement of said reinforce roller.

Claim 137 (New): The finisher as claimed in claim 136, wherein said monitoring apparatus comprises:

a first sensor configured to sense the home position of said reinforce roller; and

a second sensor configured to sense an end-of-reinforcement position where said reinforce roller ends pressing the fold.

Claim 138 (New): The finisher as claimed in claim 136, wherein when said reinforce roller fails to return to the home position within a preselected period of time, said controller

determines that said reinforce roller is fully locked and unable to return and that an error unable to be dealt with by a user has occurred, while causing said display means to display an error message.

Claim 139 (New): The finisher as claimed in claim 136, wherein when the error has occurred, said controller inhibits said reinforce roller from pressing a following stack of sheets.

Claim 140 (New): An image forming system comprising:

an image forming apparatus comprising an image forming device configured to form an image on a sheet in accordance with input image data and sheet feeder configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

a monitoring device configured to monitor a movement of said reinforce roller; and

a controller configured to cause said reinforce roller to move to a home position and to cause a display device to display a jam message when an error is detected during movement of said reinforce roller.

Claim 141 (New): The system as claimed in claim 140, wherein said display means is included in said image forming apparatus.

Claim 142 (New): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate; and

a drive configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

wherein said drive device causes a moving speed of said reinforce roller to vary from a time when said reinforce roller contacts the stack to a time when said reinforce roller does not contact said stack.

Claim 143 (New): The finisher as claimed in claim 142, wherein said drive device causes said reinforce roller to move at a lower speed when getting on the stack than when rolling on said stack.

Claim 144 (New): The finisher as claimed in claim 143, wherein said drive device increases the moving speed of said reinforce roller to a preselected speed after said reinforce roller has got on the stack.

Claim 145 (New): The finisher as claimed in claim 142, wherein assuming that said reinforce roller moves at a speed V1 before getting on the stack, at a speed V2 when getting on said stack, at a speed V3 before coming down from said stack, at a speed V4 when coming down from said stack and at a speed V6 after coming down from said stack, then said drive means satisfies:

$$V1 \geq V2$$

$$V6 \geq V4$$

$$V3 > V2, V4.$$

Claim 146 (New): The finisher as claimed in claim 142, wherein said drive device causes said reinforce roller to move at a higher speed when the stack is absent than when said stack is present.

Claim 147 (New): An image forming system comprising:

an image forming apparatus comprising an image forming device configured to form an image on a sheet in accordance with input image data and sheet feeder configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to fold a stack of sheets sequentially transferred from said image forming apparatus;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate; and

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance;

wherein said drive device causes a moving speed of said reinforce roller to vary from a time when said reinforce roller contacts the stack to a time when said reinforce roller does not contact said stack.

Claim 148 (New): In a sheet finisher configured to press a fold of a sheet stack folded and thereby reinforce said fold, a control device determines whether or not to execute pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 149 (New): The finisher as claimed in claim 148, wherein when the number of sheets is equal to or larger than a preselected value, said control device executes said processing.

Claim 150 (New): The finisher as claimed in claim 149, wherein said control device varies a number of times of pressing in accordance with the number of sheets.

Claim 151 (New): A sheet finisher configured to fold a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a control device for controlling said drive means;

wherein said control device causes said reinforce roller to perform pressing in accordance with a number of sheets constituting the stack.

Claim 152 (New): The finisher as claimed in claim 151, wherein said control device varies a moving speed of said reinforce roller during pressing in accordance with the number of sheets.

Claim 153 (New): The finisher as claimed in claim 151, wherein said control device varies a number of times of pressing in accordance with the number of sheets.

Claim 154 (New): The finisher as claimed in claim 151, further comprising a sensing device positioned upstream of said reinforce roller in the direction of sheet conveyance, wherein the sensing device is configured to sense the stack, and wherein said control device causes said reinforce roller to continuously press the fold until said sensing device senses a following next stack of sheets.

Claim 155 (New): The finisher as claimed in claim 154, wherein said control device varies a moving speed of said reinforce roller during pressing in accordance with the number of sheets.

Claim 156 (New): The finisher as claimed in claim 151, wherein said control device varies a number of times of pressing in accordance with the number of sheets.

Claim 157 (New): An image forming system comprising:

an image forming apparatus comprising image forming device configured to form an image on a sheet in accordance with an input image data and sheet feeding device configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to press a fold of a sheet stack for thereby reinforcing said fold and comprising control device configured to determine whether or not to execute processing for pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 158 (New): An image forming system comprising:

an image forming apparatus comprising an image forming device configured to form an image on a sheet in accordance with input image data and sheet feeding device configured to feed sheets to said image forming means one by one; and

a sheet finisher configured to press a fold of a sheet stack folded, thereby reinforcing said fold and comprising a control device configured to determine whether or not to execute pressing said fold in accordance with a number of sheets constituting said sheet stack.

Claim 159 (New): A sheet finisher for folding a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device configured to move said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a control device configured to control said drive device;

wherein said control means causes said reinforce roller to move to a position close to an edge of the stack to be pressed beforehand and wait at said position.

Claim 160 (New): The finisher as claimed in claim 159, wherein said control device determines, when causing said reinforce roller to move to said position beforehand, a distance of movement in accordance with size information received.

Claim 161 (New): The finisher as claimed in claim 160, wherein the distance of movement is selected to be two times as great as a distance between a stand-by position of said reinforce roller and a widthwise center of the stack to be pressed by said reinforce roller.

Claim 162 (New): The finisher as claimed in claim 160, wherein the size information is received from an image forming apparatus from which the sheets are sequentially transferred to said finisher.

Claim 163 (New): An image forming system comprising:
an image forming apparatus comprising an image forming device configured to form an image on a sheet in accordance with input image data and sheet feeding device configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to fold a stack of sheets each carrying an image formed thereon;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a drive device for moving said reinforce roller in a direction perpendicular to a direction of sheet conveyance; and

a control device configured to control the drive device;

wherein said control device causes said reinforce roller to move to a position close to an edge of the stack to be pressed beforehand and wait at said position.

Claim 164 (New): A sheet finisher configured to fold a stack of sheets each carrying an image formed thereon, said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a first drive device configured to cause said reinforce roller to move in a direction perpendicular to a direction of sheet conveyance with an electric driving force; and

a second drive device configured to allow an operator to move said reinforce roller by hand.

Claim 165 (New): The finisher as claimed in claim 164, wherein said first drive device comprises a motor, a drive pulley driven by said motor, a driven pulley and a belt passed over said drive pulley and said driven pulley, and

said second drive device comprises a lever connected to said driven pulley configured to allow the operator to rotate said driven pulley by hand.

Claim 166 (New): The finisher as claimed in claim 164, further comprising a releasing device configured to release said reinforce roller from the stack at a pressing position.

Claim 167 (New): The finisher as claimed in claim 166, wherein said releasing device comprises:

a first guide member supporting said reinforce roller such that said reinforce roller is configured to move in a direction perpendicular to the direction of sheet conveyance;

a first shaft supporting said first guide member such that said first guide member is angularly movable about one end thereof; and

a first locking device for selectively locking or unlocking said first guide member at said pressing position.

Claim 168 (New): The finisher as claimed in claim 167, wherein said first shaft comprises a shaft of said driven pulley.

Claim 169 (New): The finisher as claimed in claim 167, wherein said first drive device is supported by said first guide member while said first shaft is included in said first guide member.

Claim 170 (New): The finisher as claimed in claim 166, wherein said releasing device comprises:

a second guide member configured to receive a pressing force of said reinforce roller;

a second shaft configured to support said second guide member such that said second guide member is angularly movable in a direction perpendicular to the direction of sheet conveyance; and

a second locking configured to selectively lock or unlock said second guide member at a pressing position assigned to said reinforce roller.

Claim 171 (New): The finisher as claimed in claim 166, wherein said releasing device comprises:

a second guide member configured to receive a pressing force of said reinforce roller;

a third shaft configured to support said second guide member such that said second guide member is angularly movable in a direction perpendicular to the direction of sheet conveyance; and

a third locking device configured to selectively lock or unlock said second guide member at a pressing position assigned to said reinforce roller.

Claim 172 (New): An image forming system comprising:

an image forming apparatus comprising image forming device configured to form an image on a sheet in accordance with input image data and sheet feeding device configured to feed sheets to said image forming device one by one; and

a sheet finisher configured to fold a stack of sheets each carrying an image formed thereon;

said sheet finisher comprising:

a fold roller pair configured to fold the stack of sheets being conveyed via a nip thereof;

a reinforce roller configured to reinforce a fold of the stack of sheets folded by said fold roller pair between said reinforce roller and a guide plate;

a first drive device configured to cause said reinforce roller to move in a direction perpendicular to a direction of sheet conveyance with an electric driving force; and

a second drive device configured to allow an operator to move said reinforce roller by hand.